

Claims

1. A method of stimulating a musculature including slow twitch muscle fibers, the musculature positioned between first and second electrodes disposed at opposite ends of the musculature, comprising:

applying a resonant sequence of pulses across the musculature via a plurality of electrodes, wherein the resonant sequence includes at least three pulses, and wherein the pulses of the resonant sequence are spaced relative to one another such that each pulse subsequent to a first pulse in the sequence is effective to progressively stimulate and create tension in the musculature inwardly from the electrodes and towards the center of the musculature while maintaining the tension created in at least a portion of the musculature by each preceding pulse in the resonant sequence.

2. The method according to claim 1, wherein generating the resonant sequence includes generating the resonant sequence to have first and second pulses that have a different pulse characteristic.

3. The method according to claim 2, wherein the different pulse characteristic is selected from among a group comprising: width, amplitude, spacing, polarity, shape and some combination thereof.

4. The method according to claim 1, wherein generating the resonant sequence includes generating the resonant sequence to have first and second pulses that have an identical pulse characteristic.

5. The method according to claim 4, wherein the identical pulse characteristic is selected from among a group comprising: width, amplitude, spacing, polarity, shape and some combination thereof.

6. The method according to claim 1, further comprising generating a second resonant sequence.

7. The method according to claim 6, wherein the first resonant sequence has a different parameter from that of the second resonant sequence.

8. The method according to claim 7, wherein the different parameter is selected from among the group comprising: width, amplitude, spacing, polarity, shape and some combination thereof.

9. The method according to claim 1, wherein the pulses of the resonant sequence are spaced at around 3-10 microseconds apart.

10. The method according to claim 6, wherein the first resonant sequence and the second resonant sequence are in phase.

11. The method according to claim 6, wherein the first resonant sequence and the second resonant sequence are out of phase.

12. The method according to claim 6, wherein the first resonant sequence has an identical parameter to that of the second resonant sequence.

13. The method according to claim 12, wherein the identical parameter is selected from among the group comprising: width, amplitude, spacing, polarity, shape and some combination thereof.

14. The method according to claim 2, wherein the first and second pulses have polarities determined according to a polar profile.

15. The method according to claim 1, wherein generating the resonant sequence includes generating the pulses in the resonant sequence according to a selected number of pulses.

16. The method according to claim 1, wherein generating the resonant sequence includes generating the polarity of pulses so as to achieve a net charge.

17. The method according to claim 1, wherein generating the resonant sequence includes generating the polarity of pulses so as to achieve a balanced charge.

18. The method according to claim 1, wherein generating the resonant sequence includes generating at least one pulse of the plurality of pulses to have a trailing, faradic waveform characteristic.

19. The method according to claim 1, wherein at least one pulse of the plurality of pulses is a square waveform.

20. The method according to claim 1, wherein generating the resonant sequence includes generating a successive pulse of the plurality of pulses with a shorter width than a preceding pulse of the plurality of pulses.

21. The method according to claim 1, wherein generating the resonant sequence includes generating a first resonant sequence to have a shorter width than a second resonant sequence.

22. The method according to claim 1, wherein generating the resonant sequence includes generating the resonant sequence in response to input from a user interface.

23. The method according to claim 22, wherein the input received from the user interface concerns a parameter selected from a group consisting of: voltage intensity, pulse rate, pulse duration, charge balance, phasic modulation, rest periods and some combination, thereof.

24. The method according to claim 22, further comprising configuring the user interface to attach to a wearer.

25. The method according to claim 24, wherein the user interface fits within a pocket of the wearer.

26. The method according to claim 22, wherein the user interface transmits the input in response to commands received from a source selected from a group consisting of: a handle, pedal, dial, button, switch, voice recognition software, diagnostic equipment, motion sensor and some combination, thereof.

27. The method according to claim 1, further comprising
applying at least one additional resonant sequence to a user.

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28. A method for stimulating a musculature, comprising generating a signal configured for transcutaneous application to a user comprised of a plurality of pulses that includes a first pulse of the plurality of pulses having a shorter width than a second pulse.

29. The method according to claim 28, wherein the first pulse precedes the second pulse.

30. The method according to claim 28, wherein the second pulse precedes the first pulse.

31. An apparatus for stimulating a muscle that contracts in response to a threshold potential, comprising:

a stimulator configured to produce at least one signal for transcutaneous delivery to a musculature that includes slow twitch muscle fibers, the musculature positioned between at least two electrodes, the stimulator being operable to apply a resonant sequence of pulses across the electrodes, wherein the resonant sequence includes at least three pulses, and wherein the pulses in the resonant sequence are spaced relative to one another such that each pulse subsequent to a first pulse in the sequence is effective to progressively stimulate and create tension in the musculature inwardly from the electrodes and toward the center of the musculature while maintaining the tension created in at least a portion of the musculature by each preceding pulse in the resonant sequence.

32. The apparatus according to claim 31, wherein the signal is transcutaneously delivered to the user via at least one electrode.

33. The apparatus according to claim 31, wherein a pulse characteristic differs as between a first and second pulse of the plurality of pulses.

34. The apparatus according to claim 33, wherein the stimulator configures the pulse characteristic to be identical as between the first and second pulse of the plurality of pulses.

35. The apparatus according to claim 33, wherein the pulse characteristic is selected from among a group comprising: width, amplitude, spacing, polarity, shape and some combination thereof.

36. The apparatus according to claim 31, wherein the stimulator configures a parameter of the first resonant sequence differently than that of a second resonant sequence.

37. The apparatus according to claim 36, wherein the stimulator configures the parameter of the first resonant sequence to be identical to that of the second resonant sequence.

38. The apparatus according to claim 36, wherein the parameter is selected from among the group comprising: width, amplitude, spacing, polarity, shape and some combination thereof.

39. The apparatus according to claim 31, wherein the pulses of the resonant sequence are spaced at around 3-10 microseconds apart..

40. The apparatus according to claim 36, wherein the first resonant sequence and the second resonant sequence are in phase.

41. The apparatus according to claim 36, wherein the first resonant sequence and the second resonant sequence are out of phase.

42. The apparatus according to claim 31, wherein the stimulator initiates retrieval of a polar profile having a group of pulses with preset polarities.

43. The apparatus according to claim 31, wherein the stimulator initiates selecting a number of pulses in the resonant sequence.

44. The apparatus according to claim 31, wherein the stimulator assigns polarities of a plurality of resonant sequences to achieve a net charge.

45. The apparatus according to claim 31, wherein the stimulator assigns polarities of a plurality of resonant sequences to achieve a balanced charge.

46. The apparatus according to claim 31, wherein at least one pulse of the plurality of pulses has a faradic characteristic.

47. The apparatus according to claim 31, wherein at least one pulse of the plurality of pulses is a square waveform.

48. The apparatus according to claim 31, wherein the stimulator initiates shortening a width of a successive pulse of the plurality of pulses.

49. The apparatus according to claim 31, wherein the apparatus is configured to attach to clothing of a user.

50. The apparatus according to claim 49, wherein the stimulator is configured to fit within a pocket of the user.

51. The apparatus according to claim 31, wherein the stimulator instructs the generator to generate at least one additional signal.

52. The apparatus according to claim 31, wherein the stimulator receives input from a user interface.

53. The apparatus according to claim 52, wherein the input received from the user interface concerns a parameter selected from a group consisting of: voltage intensity, pulse rate, pulse duration, charge balance, phasic modulation, rest periods and some combination, thereof.

54. The apparatus according to claim 52, wherein the user interface attaches to the user.

55. The apparatus according to claim 54, wherein the user interface fits within a pocket of the user.

56. The apparatus according to claim 52, wherein the user interface transmits the input in response to commands received from a source selected from a group consisting of: a handle, pedal, dial, button, switch, voice recognition software, diagnostic equipment, motion sensor and some combination, thereof.

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57. An apparatus for stimulating a muscle, comprising:

a stimulator configured to produce at least one signal having a plurality of pulses having at least one successive pulse of the plurality of pulses that has a shorter width than a preceding pulse of the plurality of pulses.

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58. A program product, comprising:

(a) a program for stimulating a musculature that includes slow twitch muscle fibers, the musculature being positioned between at least a first and second electrode respectively disposed at opposite ends of the musculature, the program configured to initiate an application of a resonant sequence of pulses the musculature via the electrodes, wherein the resonant sequence includes at least three pulses, and wherein the pulses in the resonant sequence are spaced relative to one another such that each pulse subsequent to a first pulse in the sequence is effective to progressively stimulate and create tension in the musculature inwardly from the electrodes and toward the center of the musculature while maintaining the tension created in at least a portion of the musculature by each preceding pulse in the resonant sequence; and

(b) a signal bearing medium bearing the program.

59. The program product of claim 58, wherein the signal bearing medium includes at least one of a recordable medium and a transmission-type medium.